RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2143

PATENT APPLICATION
Docket No. 8371-146

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Sachin Deshpande		
Confirmation No.	8590		
Serial No.	10/003,531	Examiner:	George C. Neurauter
Filed:	November 14, 2001	Art Unit:	2143
For:	REMOTE DESKTOP PROTOCOL COMPRESSION SYSTEM		
Date:	May 22, 2006		

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AMENDMENT AFTER FINAL REJECTION UNDER 37 CFR 1.116

Responsive to the Final Office Action, dated March 21, 2006, please amend the application as follows.

Claims amendments begin on page 2.

Remarks begin on page 11.

CLAIMS

Amend the claims as follows.

1. (Currently amended) A system for transmitting data, comprising:

a server operable to generate user data for use at a client station;

a spatial compressor component of the server that is operable to inspect the user data and generate spatially compressed data therefrom;

a temporal compressor component of the server that is operable to inspect the user data and generate temporally compressed data therefrom;

a client station coupled to the server by a first communication link and structured to receive the spatially compressed data and the temporally compressed data, where the server and the client station communicate to one another over the first communication link using a remote desktop communication protocol;

a decoder component of the client station that is operable to transform the spatially compressed data and the temporally compressed data into a frame portion; and

an image generator structured to generate an image from the frame portion and show the image in a form for use by a user of the client station;

a data server responsive to commands from the client station, coupled to the server through a second communication link, the server and the data server communicating using a communication protocol other than the remote desktop communication protocol used by the server and the client station;

where the temporal compressor is adapted to XOR a portion of the user data from a current frame with a portion of the user data having a same spatial location in a previous frame to generate a difference map if the portion of the user data from the previous frame is in cache; and

where the temporal compressor is adapted to generate a difference table by run length encoding each row ~~scan line~~ of the difference map.

2. (Currently amended) The system of claim 1,

where the data server is structured to complete a functional task requested by the client station.

~~where the server and the client station are coupled to one another by a communication link; and~~

~~where the server and the client station communicate to one another over the communication link using a remote desktop communication protocol~~.

3. (Currently amended) The system of claim 2,

where the functional task is to display a video, and the data server is structured to stream a video clip to the server that communicates the video clip to the client station

~~further comprising a data server coupled to the server through a second communication link, the server and the data server communicating by using a communication protocol other than the remote desktop communication protocol used by the server and the client station~~.

4. (Currently amended) The system according to claim 1 ~~3~~ where the data server is a video server.

5. (Original) The system according to claim 1, further comprising one or more additional client stations each of which is coupled to the server and structured to receive the spatially compressed data and the temporally compressed data.

6. (Previously presented) The system according to claim 1 where the frame portion is a bitmap.

7. (Previously presented) The system according to claim 1 where the frame portion is one frame of a video.

8. (Previously presented) The system according to claim 1

where the user data comprises data that is for the use of the client station at a first and a second time and

where the temporal compressor is structured to perform the XOR operation using data for the use of the client station at the first and the second time as inputs, and produce the difference map.

9. (Canceled)

10. (Currently amended) The system according to claim 1 ~~8~~

where the difference table comprises one or more number pairs;

where a first number of the number pair indicates the number of zeros in a current run and

where a second number of the number pair indicates a symbol following the last zero in the current run.

11. (Currently amended) The system according to claim 1 ~~10~~ where if a last number of a row in the difference map to be run length encoded is a zero, for the last number pair in the difference table, a first number of the last number pair indicates one less than the number of zeros in a current run.

12. (Previously presented) The system according to claim 1 where the temporal compressor creates a lossless temporal encoding of the user data.

13. (Original) The system according to claim 1, further comprising a comparison component of the server that is operable to examine the user data, the spatially compressed data, and the temporally compressed data, and to select any combination therefrom to transmit to the client station.

14. (Original) The system according to claim 13 wherein the comparison component is structured to select the smallest combination or sub-combination of the user data, the spatially compressed data, and the temporally compressed data prior to transmitting it to the client station.

15. (Currently amended) A system for transmitting data, comprising:

a server running an application program for generating multimedia data;

a data compressor structured to accept the multimedia data at an input and produce spatially and temporally compressed multimedia data at an output;

a thin client coupled to the server by a communication link and structured to receive the spatially and temporally compressed multimedia data; and

an image generator structured to gencrate a multimedia image from the spatially and temporally compressed multimedia data received by the thin client;

a data server responsive to commands from the client station, coupled to the server through a second communication link, the server and the data server structured to communicate using a communication protocol other than that used by the server and the client station;

where the data compressor is adapted to XOR a portion of the user data from a current frame with a portion of the user data having a same spatial location in a previous frame to generatc a difference map if the portion of the user data from the previous frame is in cache; and

where the data compressor is adapted to generate a difference table by run length cncoding each row ~~scan line~~ of the difference map.

16. (Cancelled)

17. (Cancelled)

18. (Currently amended) The system according to claim 15 ~~17~~ where the data servcr is a vidco server.

19. (Original) The system according to claim 15, further comprising one or more additional thin clients each of which is coupled to the server and structured to receive thc spatially and temporally compressed multimedia data.

20. (Previously presented) The system according to claim 15

where the multimedia data comprisc data that is for the use of the thin client at a first and a second time; and

where the data compressor is structured to perform an XOR operation using data for the use of the thin client at the first and the second time as inputs, and produce a difference map.

21. (Canceled)

22. (Currently amended) The system according to claim 15 ~~20~~

where the difference table comprises one or more number pairs;

where a first number of the number pair indicates the number of zeros in a current run; and

where a second number of the number pair indicates a symbol following the last zero in the current run.

23. (Currently amended) The system according to claim 15 ~~21,~~ where, if a last number of a row in the difference map to be run length encoded is a zero, for the last number pair in the difference table, a first number of the last number pair indicates one less than the number of zeros in a current run.

24. (Currently amended) A method of transferring data in a system including a server coupled to a thin client ~~by a communication link that carries a remote desktop protocol~~, the method comprising:

on the server:

establishing a first communication link between the server and the data server that uses a first communication protocol to supply multimedia data;

generating the multimedia data;

compressing the multimedia data spatially to make spatially compressed multimedia data; ~~and~~

determining if a portion of the user data from a current frame is stored in cache;

generating a difference map by temporally compressing the spatially compressed multimedia data by XORing the portion of the user data from the current frame with a portion of the user data having a same spatial location in a previous frame responsive to the determining; ~~and~~

generating a difference table by run length encoding each row ~~scan line~~ of the difference map; and

transmitting the difference table to the thin client using a second communication link distinct from the first communication link that uses a second communication protocol different than the first communication protocol;

on the thin client:

receiving the difference table from the server;

de-compressing the difference table into useable data; and

presenting the useable data on the thin client.

25. (Original) The method of claim 24, further comprising storing the useable data in a cache on the thin client.

26. (Previously presented) The method of claim 24 where presenting the useable data on the thin client comprises generating an image on a display screen.

27. (Previously presented) The method of claim 24 where presenting the useable data on the thin client comprises showing a video clip on a display coupled to the thin client.

28. (Previously presented) The method of claim 27 where showing a video clip comprises showing a series of frames on the display.

29. (Currently amended) The method of claim 27 where generating the multimedia data comprises:

establishing the communication link ~~a data connection with a video server~~;

retrieving video data from the data ~~video~~ server; and

converting the video data to display data.

30. (Previously presented) The method of claim 24 where a plurality of thin clients are coupled to the server, the method further comprising transmitting the difference table to the plurality of the thin clients coupled to the server.

31. (Previously presented) The method of claim 30 where transmitting the difference table to the plurality of the thin clients comprises transmitting the difference table to the plurality of thin clients simultaneously.

32. (Previously presented) The method of claim 24 where de-compressing the difference table comprises creating bitmaps of data.

33. (Previously presented) The method of claim 24 where comprcssing the diffcrence table comprises lossless data compression of the multimedia data.

34. (Previously prcsented) The method of claim 24 where compressing the multimedia data comprises performing an XOR operation on data that is scheduled to be presented on the thin client at different times, the XOR operation creating the difference output.

35. (Original) The mcthod of claim 34, further comprising encoding a plurality of difference codes.

36. (Previously prescnted) The method of claim 35

where encoding a plurality of difference codes comprises generating one or more numbcr pairs;

where a first number of the number pair indicates the number of zeros in a current run; and

where a second number of the number pair indicates a symbol following thc last zero in the current run.

37. (Previously presented) The method according to claim 35,

where encoding a plurality of difference codes comprises generating onc or more number pairs and

where if a last number of a row in the difference codes to be run length encoded is zero, for the last number pair in the difference tablc, a first number of a last number pair indicates one less than the number of zeros in a current run.

38. (Previously presented) The method according to claim 24 where compressing the multimedia spatially and temporally comprises:

performing a procedure on the multimedia data intended to compress the multimedia spatially; and

determining if the first procedure created a result smaller than the multimedia data.

39. (Previously presented) The method according to claim 24 compressing the multimedia spatially and temporally comprises:

performing a procedure on the multimedia data intended to compress the multimedia temporally; and

determining if the procedure created a result smaller than the multimedia data.

40. (Currently amended) The system of claim 1 where the client station includes the cache, and the server is adapted to store the user data from the previous frame to compare with the user data from the current frame to produce a coded difference, and to send the coded difference to the client station.

41. (Currently amended) The system of claim 1 where the temporal compressor is adapted to indicate to the server that it should transmit the difference map to the client station if the difference map is smaller than the portion of the user data from the current frame.

42. (Currently amended) The system of claim 15 where the cache is included in the thin client, and the server is adapted to store the user data from the previous frame to compare with the user data from the current frame to produce a coded difference, and to send the coded difference to the thin client.

43. (Currently amended) The system of claim 15 where the temporal compressor is adapted to indicate to the server that it should transmit the difference map to the client station if the difference map is smaller than the portion of the user data from the current frame.

44. (Previously presented) The method of claim 24 where determining if the portion of the user data from a current frame is stored in the cache includes determining if the portion of

the user data from a current frame is stored in the cache on the thin client by keeping track of the cache contents of the thin client cache.

45. (Previously presented) The method of claim 24 where transmitting the difference table to the thin client occurs responsive to a determination that the difference table is smaller than the multimedia data.

46. (Currently amended) A system for transmitting data, comprising:

a server operable to generate user data for use at a client station;

a spatial compressor component of the server that is operable to inspect the user data and generate spatially compressed data therefrom;

a temporal compressor component of the server that is operable to inspect the user data and generate temporally compressed data therefrom;

a client station coupled to the server by a first communication link, and structured to receive the spatially compressed data and the temporally compressed data using a remote desktop communication protocol;

a decoder component of the client station that is operable to transform the spatially compressed data and the temporally compressed data into a frame portion;

an image generator structured to generate an image from the frame portion and show the image in a form for use by a user of the client station; and

a data server, responsive to commands from the client station, distinct from the client station, coupled to the server through a second communication link, the server and the data server communicating by using a communication protoeol other than the remote desktop communication protocol used by the server and the client station.

REMARKS

Claims 1-8, 10-20 and 22-46 are pending in the application prior to entering this amendment.

The examiner objects to claims 40 and 42 for informalities.

The examiner rejects claims 1-8, 10-20, and 22-45 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The examiner rejects claims 40 and 41 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

The examiner rejects 1-7, 13-16, 19, 24-32, and 38-46 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Virtual Network Computing ("VNC"). The examiner rejects claims 8-9, 20-21, and 34-35 under 35 U.S.C. § 103(a) as unpatentable over VNC in view of Mairs et al. (U.S. patent no. 5,864,711). The examiner rejects claims 9, 21, and 35 under 35 U.S.C. § 103(a) as unpatentable over VNC in view of Aharoni et al. (U.S. patent no. 6,014,694). The examiner rejects claims 10, 22, and 36 under 35 U.S.C. § 103(a) as unpatentable over VNC in view of Mairs and further in view of Tsai et al. (U.S. patent no. 5,818,877). The examiner rejects claims 11, 23, and 37 under 35 U.S.C. § 103(a) as unpatentable over VNC in view of Mairs and Tsai and further in view of Gill et al. (U.S. patent no. 6,259,810). The examiner rejects claims 12 and 33 under 35 U.S.C. § 103(a) as unpatentable over VNC in view of Yanagihara et al. (U.S. patent no. 5,742,728). The examiner rejects claim 15 under 35 U.S.C. § 103(a) as unpatentable over Lakritz. (This last rejection is a clerical error by the examiner as we explain in more detail below.).

The applicant amends claims 1-4, 10, 11, 15, 18, 22-24, 29, 40-43, and 46 and cancels claims 16 and 17 without prejudice. The applicant previously canceled claims 9 and 21.

Claims 1-8, 10-15, 18-20, and 22-46 remain in the case after entering this amendment.

The applicant adds no new matter and requests reconsideration.

Response to Arguments

The applicant amends independent claims 1, 15, 24, and 46 to overcome their respective rejections, as explained below. These amendments also address the examiner's concerns that the data server has no functional relationship with any other element recited in the claims. The claims now provide more clearly described functional relationships with both the server and the

client. For example, claim 1 now recites a *data server responsive to commands from the client station, coupled to the server through a second communication link.*

Claim Objections

The examiner confirmed during a telephone call on April 12, 2006 that his objections to claims 40 and 42 are in error, and the objection is instead to claims 41 and 43. The applicant amends claims 41 and 43 to overcome the examiner's objections.

Claim Rejections Under § 112

The examiner rejects claims 1-8, 10-20, and 22-45 because they fail to comply with the written description requirement. The examiner rejects claims 40 and 42 because they fail to comply with the enablement requirement.

The applicant amends claims 1, 15, and 24 to replace "scan line" with —row— to obviate the examiner's rejection. The specification supports this amendment at various portions, including page 16, lines 3-6.

The applicant amends claims 40 and 42 to more clearly define the server, including adding that the server is adapted to store the user data from the previous frame to compare with the user data from the current frame to produce a coded difference, and to send the coded difference to the client station. The added limitations to claims 40 and 42 enable the temporal compressor and server to identify and locate a previous frame contained within the cache of the client. In stark contrast to the examiner's allegations, the XOR operation can be performed because the temporal compressor has access to the user data of the previous frame.
The specification supports this amendment in various portions, including at page 12, lines 11-16.

These amendments overcome the examiner's § 112 rejections of claims 1-8, 10-20, and 22-45.

Claim Rejections Under §§ 102 and 103

The examiner rejects claims 1-7, 13-16, 19, 24-32, and 38-46 as old or obvious over VNC in view of various combinations of Mairs, Aharoni, Tsai, Gill, and Yanagihara.

The applicant traverses the examiner's rejections for the reasons that follow.

The applicant amends independent claims 1, 15, and 46 to recite limitations that are neither anticipated nor obviated by VNC either by itself or in combination with any other reference of record.

Amended claim 1 recites *a data server responsive to commands from the client station, coupled to the server through a second communication link, the server and the data server communicating using a communication protocol other than the remote desktop communication protocol used by the server and the client station.* Claim 15 includes a similar limitation. Claim 24 recites *establishing a first communication link between the server and the data server that uses a first communication protocol to supply multimedia data* and *transmitting the difference table to the thin client using a second communication link distinct from the first communication link that uses a second communication protocol different than the first communication protocol.* Claim 46 recites *a data server, responsive to commands from the client station, distinct from the client station, coupled to the server through a second communication link, the server and the data server communicating by using a communication protocol other than a remote desktop communication protocol used by the server and the client station.*

VNC does not disclose such a recited data server. The examiner deemed moot arguments relating to the patentability of claims 1 and 15 because the data server was not a recited element. The applicant now amends claims 1 and 15 to include the previously erroneously excluded data server. In addressing the data server recited in claim 46, the examiner notes that the claim 46 "simply recites that the server and data server communicate over a different communication protocol than the remote desktop communication protocol." The examiner interprets the limitation as "any of the number of known communication protocols and/or to the data server and the server." The applicants contend that it is not necessary to specifically identify what data is being communicated between the data server and the server. And claim 46 recites a data server that is distinct from and operates responsive to commands from the client station (providing a structural relationship with the client station). Claim 46 requires not that the data server and the server communicate in "any number of known communication protocols" as the examiner alleges, but that they communicate through a second communication link using a protocol *other than* (i.e., different or distinct) from the remote desktop communication protocol used between the server and the thin client through the first communication link.

Even if the applicant agrees with the examiner's assertion that the VNC teaches that the protocol may have more than one type of transport —the applicant does not so agree—, the VNC fails to disclose the existence of two different protocols operating in the same system using two distinct communication links as is required by the claim. None of the other cited references alleviate the deficiency.

Relative to claim 3, the examiner notes that the claim fails to specify how the data server is functionally inter-related to other elements. Since the applicant has incorporated limitations similar to those from original claims 2 and 3 into claim 1, it amends claim 1 to provide such an interrelationship to obviate the examiner's objection. The applicant asks the examiner to give the data server its due weight.

Claim 11 recites *where if a last number of a row in the difference map to be run length encoded is a zero, for the last number pair in the difference table, a first number of the last number pair indicates one less than the number of zeros in a current run.* Claims 23 and 37 include a similar limitation. The examiner acknowledges that the VNC, Mairs, and Tsai do not disclose this limitation but argues that Gill provides the missing link. But Gill discloses at column 10, lines 42-46, that "once the last column of any row is detected by step 142, transparent pixels from the end of a row are removed and the length counter 77 reduced for that row a corresponding amount (to zero if the entire row is transparent)." Gill appears to disclose truncation, or shortening, of the row if zeroes are present at its end. Gill does not disclose coding to deal with the presence of zeroes as recited. As the applicant notes above, claims 11, 23, and 37, recites a specific coding where a first number of a last number pair indicates one less than the number of zeros in a current run.

The applicant requests the examiner allow independent claims 1, 15, 24, and 46. Since claims 2-8, 10-14 depend from claim 1, claims 40-41 depend from claim 15, and claims 18-20, 22-23, and 42-43 depend from claim 24, the applicant requests the examiner allow these claims as well.

Conclusion

For the foregoing reasons, the applicant requests reconsideration and allowance of all remaining claims. The applicant encourages the examiner to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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